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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,698	06/01/2001	Gerald Morrison	04694.00070	1792

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EXAMINER

NGUYEN, KIMNHUNG T

ART UNIT	PAPER NUMBER
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2674

DATE MAILED: 05/07/2004

11

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/870,698

Applicant(s)

MORRISON ET AL.

Examiner

Kimnhung Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 14-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-12 and 14-30 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This application has been examined. The claims 1-12, 14-30 are pending. The examination results are as following.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by McAvinney (US patent 4,746,7706, cited by Applicant).

Regarding claim 1, McAvinney disclose in figures 1 and 10, a method of determining the position of an object relative to a reference frame (2, figure 2) from captured images of the object based on multiple triangulation results, the captured images being taken by at least two pair of cameras (see optical sensors 20, 24, 28 and 34) having an inherent overlapping fields of view within said reference frame, at least one of said cameras having an offset angle causing an extremity of the field of view encompassing said reference frame, the method comprising the steps of capturing an image of the object (see finger or pencil, see column 3, lines 18-20) using each camera of said at least two pair cameras (20, 24) at least one location within said reference frame; for each location: determining the position of the object within each captured image and for each captured image placing the determined position into a coordinate system (see figure 10); and

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processing the determined positions to determined at least one of the position of the object at each location and the offset angle of said at least one camera (20).

Regarding claim 2, McAvinney discloses the position of the object within each image is represented an inherent by an angle, said angle being equal to the angle formed between the extremity of the field of view extending beyond the reference frame boundary and a line extending from the camera that intersects the object within the image (see figure 10)

Regarding claim 3, McAvinney discloses the processing said angle is converted into a rectangular (X, Y) position within the reference frame coordinate system (see column 6, lines 14-16).

*Allowable Subject Matter*

3. Claims 7-12, and 14-30 are allowed.

4. Claims 4-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

The present invention is directed to a method of determining the position of an object relative to a reference frame from captured image of the object based on multiple triangulation and the captured images being taken by at least two cameras. The closest prior art, McAvinney (US 4,746,770) and O'Brien et al. (US 4,247,767) show a similar system also disclose the a reference frame from captured image of the object based on triangulation and the captured images being taken by at least two pair cameras. However, they fail to teach the method of claim 3 wherein

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each of the cameras having a field of view offset with respect to said reference frame, and processing as claim 4 (see the equations of claim 4), or determining the offset angle for each offset camera; for each offset camera subtracting the offset angle from the angle representing the position of the object within the image taken by said offset camera to calibrate the angle; for each pair of cameras using the calibrated angles to calculate the position of the object with respect to the reference frame using triangulation as claim 7, or determining an offset angle of each camera relative to the reference frame, said offset angle representing the degree by which the field of view of the camera extends beyond said reference frame; for each camera, using the offset angle to calibrate the object position data developed from the image acquired by that camera; and using the calibrated object position data during triangulation for each pair of cameras to determined the position of said object relative to said reference frame as claim 9, or determining the position of the object within each captured image being represented by an angle, said angle being equal to the angle formed between an extremity of the field of view of the camera that acquired the image extending beyond the reference frame and a line extending from that camera that intersects the object within the image; and mathematically calculating the offset angles of the cameras having rotated fields view based on the angle determined for each image and the position of the cameras relative to the coordinate system assigned to said reference frame as claim 10, or a processor processing the captured images and generating object position or pointer data when an object or pointer appears I images, said processor determining the position of said object relative to said origin in rectangular coordinates using said object position data or pointer based on multiple triangulation results, wherein said processor further executes a calibration routine to determine offset angles of said cameras, said offset angles being used by

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said processor to adjust said object position data or pointer thereby to align said multiple triangulation results prior to said position determination as claims 12, 23 and 27.

***Response To arguments***

6. Applicant's arguments filed on 12-15-03 have been fully considered but they are not persuasive in view of new ground rejection.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimnhung Nguyen whose telephone number (703) 308-0425.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **RICHARD A HJERPE** can be reached on **(703) 305-4709**.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D. C. 20231


**Or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only).**

Hand-delivery response should be brought to: Crystal Park II, 2121 Crystal Drive, Arlington, VA Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Kimnhung Nguyen  
April 29, 2004



**RICHARD HJERPE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2600**